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reconstruction of the social world, and the consequent appearance of the new self that answers to the new object.

GEORGE H. MEAD.

THE UNIVERSITY OF CHICAGO.

SOCIETIES

NEW YORK BRANCH OF THE AMERICAN PSYCHOLOGICAL ASSOCIATION

THE New York Branch of the American Psychological Association met in conjunction with the Section of Anthropology and Psychology of the New York Academy of Sciences, on Monday, April 28, at Columbia University. From the point of view of attendance and general interest, the session was one of the most successful held in recent years. Members of the New York Branch dined at the Faculty Club between the afternoon and evening sessions, and attended a smoker at the Faculty Club after the evening programme. The following officers were elected for the ensuing year: Chairman of the New York Branch, Professor Wendell T. Bush; Secretary-Treasurer, Dr. H. L. Hollingworth. The following papers were presented:

Families of American Men of Science:[1] J. MCKEEN CATTELL.

A Comparison of the Records of the Criminal Woman and the Working Child in a Series of Mental Tests:[2] CLARA JEAN WEIDENSALL.

The Mentality of Boys in the New York Probationary School—Public School 120—as determined by the Binet-Simon Tests: A. E. REJALL.

The New York City Probationary School, formerly Public School 120, located on the "Lower East Side" of Manhattan, became in 1905 a school for the detention and care of incorrigible boys in New York City. Boys attending this school constitute as a class a rough, rebellious, uncontrollable group, and are sent to the school for the following reasons given in order of their frequency: truancy, insubordination, theft, immorality, and violation of the Child Labor Law.

During the period October, 1912, to April, 1913, 103 of the 120 boys which the school normally accommodates were tested by the 1911 Revised Binet-Simon Scale, with the following results: 10 per cent. were of normal intelligence, 70 per cent. were from one to four years backward, and 20 per cent. were distinctly feeble-minded, being from four to six years behind. The average chronological age was thirteen years and ten months, and the average age retardation per pupil was two and one half years.

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[1] This paper was a partial report of an extended investigation which is to be presented in full in forthcoming numbers of *Science*.

[2] Abstract not furnished.

These results reinforce the conclusions of others who have used the Binet-Simon Tests on incorrigibles, that mental deficiency is at least an accompaniment and possibly a cause of incorrigibility.

Some Individual Differences in Immediate Memory Span: GEO. F. WILLIAMSON.

The writer experimentally tested 31 males and 69 females—in all, 100 subjects. "The 'memory span' is the largest amount of any given material which can always be correctly reproduced immediately after one presentation."[3] The writer has hoped to throw some light on individual and sex differences in immediate memory span.

The materials used were letters (consonants) and figures of one place. The subjects were told what constituted the immediate memory span, and informed that the presentations would be of a gradually expanding series. From time to time, the number of elements in any given "series-presentation" was mentioned by the experimenter. To avoid rhythm, letters and figures were pronounced in a loud tone of voice, to the beats of a metronome—one a second. The subjects listened until the completion of the reading of any *one* series, and then immediately wrote down, in the proper order, what they had heard. Another set was then presented. The test began with a series of six letters, then one of seven was pronounced, one of eight, and finally a series of nine letters. Next another series of six letters was read, then one of seven, one of eight, and again one of nine. Subjects recorded after each "set-presentation." Having completed the eight sets of letters, the eight series of figures were given in exactly the same manner. Credit was given for series correctly reproduced in the proper order. Each individual was credited with the *highest number* of letters or figures that he reproduced correctly every time that many were given him. This was taken as his Immediate Memory Span.

With increase in series length, passing from six-series to nine-series, there is a steady increase in the average number of *mistakes* per individual, and in the average deviation (excepting in the nine-series, where the A.D. is less than in the eight-series). This is practically the case, when (on a per cent. basis) we consider the sexes separately. With series of *all* lengths, we have an average number of mistakes for letters of 5.72, with an A.D. of 2.24; while for figures it is only 3.93, but with a greater A.D. of 2.39. When we here consider the sexes separately, we have the same greater number of mistakes for letters, and decidedly greater variability for figures. For both letters and figures, with series of *all* lengths, there is a grand average number of mistakes of 4.83, with an A.D. of 2.32. From the point of view of the sexes, the same relation holds. However, with all the series, in both letters and figures, the women make more mistakes than the men (Av., women, 4.96, men, 4.50). But the men are more variable than the women (A.D., men, 2.41, women, 2.22).

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[3] Ladd and Woodworth, "Physiological Psychology," page 574.

The following table gives the facts for the Immediate Memory Span.

IMMEDIATE MEMORY SPAN—100 SUBJECTS

		Letters		Figures		Grand av.	
	Mode	6.0		6.0		6.0	
	Av.	5.69		6.47		6.08	
	A.D.	0.59		0.92		0.76	
	S.D.	0.73		1.09		0.91	
		Men	Women	Men	Women	Men	Women
On per cent. basis.	Mode	5.0	6.0	7.0	6.0	6.0	6.0
	Av.	5.58	5.74	6.76	6.36	6.17	6.05
	A.D.	0.60	0.58	0.89	0.87	0.75	0.73

Using the Pearson Coefficient, the writer correlated the memory spans of the 100 subjects for letters and for figures. $r = +.26$ (only), with a P.E. of .06. For the 31 men alone, $r = +.31$, with a P.E. of .10. For the 69 women, $r = +.27$, with a P.E. of .07.

The Order of Merit Method and the Method of Paired Comparisons:

MABEL BARRETT.

In this experiment, the order of merit method and the method of paired comparisons were applied to three series of materials involving judgments of varying subjectivity. The three series consisted of (1) weights, to be judged with respect to their heaviness, (2) specimens of handwriting, to be judged with respect to their excellence, and (3) propositions of varying validity, to be judged with respect to the subject's degree of belief in the fact stated.

The results were used as data by which to compare the relative efficiency of the two methods with regard to statistical investigation of judgment. Seven main problems are suggested, each of which involves a basis of comparison between the two methods.

I. The variability of each specimen in the series from the average position accorded to that specimen, and the consequent average variability of the series. In the case of weights, this average variability is, by the order of merit method, slightly greater than by the paired comparisons method, and in handwriting judgments the exact opposite is true. These averages in isolation might indicate that the one method is particularly favorable to judgment of weight, the other to judgment of handwriting—or the one method to the one group of subjects, and the other method to the other group. These hypotheses are, however, invalidated by the exceedingly high correlation between the two methods for any one type of judgment, and by a comparison of the variabilities in handwriting and beliefs, where the judgments were performed by the same group of subjects. The average of these variabilities for the three types of judgment shows a difference of only .02 between the two methods. The differences in isolated cases may be due to the materials themselves or to the groups themselves apart from any consideration of method. They are very evidently *not* due to the *methods.*

II. The second problem is the correlation of the average order with the objective order of the series, by the two methods. In judgment of weights this correlation is exactly the same, and in handwriting *almost* exactly the same for one method as for the other. The difference in the latter case is only .003. In the case of beliefs there is no objective order.

III. The correlation between the arrangements of a given series by the one method and by the other averages .987 for the three types. This indicates that it is unnecessary to employ either one of these methods, which for any reason is less to be preferred, if we consider them with respect to the general results obtained by both.

IV. The individuals of the group correlate as well with their average in the one method as in the other. The differences between the average correlations by the two methods lie in every case within the limits of the probable error.

V. An individual who stands high in correlation with the group arrangement by one method also tends to stand high in that correlation by the other method. This relation is expressed by the correlation +.72 in the case of handwriting and beliefs. In the case of weights, the relation is a random one, +.01. The individual differences in correlation with the average, are, by the paired comparisons method, so insignificant as to make the *order* of correlations subject to chance and very unreliable.

VI. The order of merit method shows a random relation (—.01) between an individual's judgment of handwriting and the same individual's judgment of beliefs. This result accords with the results obtained by other investigations of this sort of problem. In the paired comparisons method this correlation is expressed by —.35.

This represents the first and only discrepancy between the equal efficiency of the two methods in this experiment.

VII. A comparison of the groups which performed the one method first with the groups which performed the other method first shows that the method which is employed first does not tend in any way to improve the judgments made by the method which follows it a month later.

On the basis of the efficiency of the two methods for statistical investigation of judgment we may conclude that the one method is in no way to be preferred to the other. From the point of view of convenience, labor, and time required, the order of merit method is by far the more satisfactory of the two.

Effect of Size and Frequency on Permanence of Impression: E. K. STRONG, JR.

In an experimental study continued for some five months considerable information was obtained which throws light upon the statement that in advertising "small space in many media is better than large space in few media." Two points of interest to the psychologist were discussed in the present paper: (1) how does an increase in the size of an advertisement (increase of vividness) affect the permanency of impression made upon the reader? and (2) how does continued repetition of a firm's advertisements affect this permanency of impression?

When the presentations occurred one month apart and the impression was tested one month later by the recognition-test, it was found: (1) that the value of space increases approximately as the square-root of the increase in area, and not directly with the increase in area, and (2) that in this particular case the value of repetition increased exactly as the cube-root of the number of presentations.

The Effects of Strychnine on Mental and Motor Efficiency: A. T. POFFENBERGER, JR.

The investigation was undertaken to determine the effect of ordinary medicinal doses of strychnine on mental and motor processes, and to provide material for a comparative study of the effects of strychnine and caffeine on these processes.

Two subjects were experimented on for a period of thirty days. The test periods were: 9:30 A.M., 1:30, 3:30, and 5:30 P.M.; and for one of the subjects, an additional test at 8:30 P.M. The tests used were as follows: steadiness test, three-hole test, and tapping test, as measures of motor efficiency; and the color-naming test, opposites test, cancellation test, addition test, and multiplication test, as measures of mental efficiency. The motor tests are well known and need no description. The color-naming, opposites, and cancellation tests are described by Woodworth and Wells in their monograph on Association Tests. The addition test required the addition of 17 to each of 50 two-place numbers, and the multiplication test required the multiplication of each of 25 two-place numbers by 7.

The strychnine was given in capsule form, in doses of 1/30 grain during the first week and 1/20 grain during the rest of the period. Each day at 2:45 a capsule was taken, and whether it was a strychnine capsule or only a sugar capsule, the subjects did not know. The schedule was so arranged that in the four weeks about all the combinations of doses were obtained which had been used in the caffeine tests with the 16 subjects. At the end of the four-weeks' period, a two-day intensive study was made, in which tests were begun at 8:30 A.M. and repeated every half hour, until 8:30 P.M. with the exception of two periods for lunch and dinner. In these two days the capsule was taken at 1:45 P.M. A daily introspective report was required from each subject, in which he recorded his physical condition, etc.

Although the dose was as large as that given in practise, no consistent physical symptoms were noted, such as disturbances of sleep, restlessness, etc., such as were common in the caffeine reports. The curves constructed from the daily tests, and those from the combination of the whole four weeks for separate test periods, show neither an increase in efficiency nor a following period of decreased efficiency, although relapse after stimulation is given as one of the common characteristics of the action of strychnine. The results of the two-day intensive study do not differ from the preceding tests.

There are two possible conclusions to be drawn from the work at this stage. First, the two subjects studied may, by chance, not be susceptible to the action of strychnine except in very large doses. This possibility will be tested by further work with a number of subjects. Secondly, since strychnine acts predominantly on the lower centers of the central nervous system, those in the cord and medulla, the mental processes studied should not be affected. Also, the only effect on motor activity would be a delay of the onset of fatigue by artificially keeping up the tonus of the muscles, a factor which would not enter into the motor tests as they were conducted. The writer inclines to the latter view.

H. L. HOLLINGWORTH,
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